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3	69	(project\$3 and (display or imag\$3)).ab. and (light or laser) and (mirror or refelct\$3) and (sweep\$3 and oscillat\$3) and (axis or horizontal or horizontal) and frequenc\$3	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/08/13 11:21
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4	63	((project\$3 and imag\$3).ab. and (light or laser) and (mirror or refelct\$3) and (sweep\$3 or oscillat\$3) and (axis or horizontal or horizontal) and frequenc\$3) and ((project\$3 and (display or imag\$3)).ab. and (light or laser) and (mirror or refelct\$3) and (sweep\$3 and oscillat\$3) and (axis or horizontal or horizontal) and frequenc\$3)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/08/13 11:27

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Optical raster-scanning displays based on surface-micromachined polysilicon mirrors

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This paper appears in: Selected Topics in Quantum Electronics, IEEE Journal on

On page(s): 67 - 74

Jan.-Feb. 1999

Volume: 5 Issue: 1

ISSN: 1077-260X

References Cited: 21

CODEN: IJSQEN

INSPEC Accession Number: 6190690

Abstract:

We demonstrate high-resolution, raster-scanning display systems based on pairs of orthogonally scanning, surface-micromachined mirrors. The first mirror of the raster-scanning pair determines the line-scan rate of the display and is driven at its resonant frequency which is on the order of 4.7 kHz. The second mirror, driven at a frequency below its resonance and scanning orthogonally to the first mirror, determines the image refresh rate. Both mirrors have a maximum optical scanning angle of 15/spl deg/. Single-chip and two-chip scanners are demonstrated. The resolution of the single-chip display, based on average pixel size, is 102/spl times/119 pixels. The curvature of the mirror surfaces are characterized and optically compensated to achieve this resolution.

Index Terms:

display devices optical scanners micro-optics mirrors micromachining optical raster scanning display surface micromachining polysilicon micromirror single-chip scanner two-chip scanner microoptoelectromechanical system Si

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